Space Weather Forecast

Issued on Saturday, 24 December 2022 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor geomagnetic storms

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only common class flares observed, the largest from the easternmost of the two central northern disc sunspot regions. This complex of spots includes mature spots which have exhibited some decline, but also a central area of small developing spots that will be monitored for any potential further increase in complexity. The other three regions and these are small, simpler and stable. No Earth-directed coronal mass ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: Elevated solar winds became enhanced further due to a transition into the fast winds from a coronal hole. Speeds of 450-550 km/s were observed for much of the period before increasing to 550-600 km/s after 23/2000 UTC. The strength of the magnetic field carried by the wind was Moderate. The north-south component of the field oscillated between being northward and southward directed, but included some periods of Moderate southward field. Geomagnetic activity was Quiet to Active with two G1/Minor Storm intervals at 23/1200-1500 UTC and 23/2100-0000 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain Low, with further common class flares likely but only a slight chance of Moderate flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs, however a weak and narrow CME that is expected to pass behind the Earth may give a glancing impact on day 1 (24th). Solar winds are forecast to be slightly elevated or elevated through the period due to ongoing fast winds, with a further enhancement likely from the arrival of further coronal hole sourced fast winds day 3 or day 4 (26th or 27th). Quiet to Active geomagnetic activity is expected at first day 1 (24th), with a chance of G1/Minor Storm intervals, and later if any glance occurs from the passing CME. Otherwise easing by day 2 (25th) to Quiet with Unsettled spells and isolated Active intervals. Although an ongoing chance of further G1/Minor storms, greatest day 3 (26th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	20	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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